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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MERCADO, JULIAN A

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 11/08/2002

16

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/448,144

Applicant(s)

SAITOU ET AL.

Examiner

Julian Mercado

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 September 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 6-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-5, 16 and 17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 4, 2002 has been entered.

### ***Remarks***

The rejection of claim 3 under 35 U.S.C. 112, first paragraph has been withdrawn.

The rejection of claims 1, 4, 5 and 16 under 35 U.S.C. 102(e) and the rejection of claim 17 under 35 U.S.C. 103(a) based on Hwang et al. has been withdrawn.

The rejection of claims 1, 4, 5 and 16 under 35 U.S.C. 102(e) based on Hiermaier et al. has been withdrawn.

The rejection of claim 2 under 35 U.S.C. 103(a) based on Hiermaier et al. and Hwang et al. has been withdrawn.

The rejection of claim 3 under 35 U.S.C. 103(a) based on Hwang et al. and Hiermaier et al. has been withdrawn.

The rejection of claim 1 under 35 U.S.C. 103(a) based on Takada et al. has been withdrawn.

***Claim Rejections - 35 USC § 102 and 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-5 and 17 are rejected under 35 U.S.C. 102(a) as being anticipated by Fukui et al. (WO99/19927).

For purposes of discussion, the examiner relies on the equivalent disclosure of Fukui in U.S. Pat. 6,440,598 B1.

Regarding claims 1-5 and 17, Fukui teaches a separator substrate for a proton exchange fuel cell having a multi-coating layer comprising a low electric resistance layer such as graphite particles [GP], a corrosion resistance layer such as preformed oxide layer on the substrate (col. 3 line 32-33), and a peeling resistance layer such as a diffusion layer [DL].

The graphite particles are specifically disclosed to be of low electrical resistance. (col. 5 line 48-51)

~~Carbonaceous particles such as graphite particles or carbon black aggregates exhibit low contact resistance and superior acid resistance without formation of an oxide film on their surfaces. In addition, a surface of a stainless steel~~

In addition to the preformed oxidized surface functioning as a corrosion resistant layer, additional metals such as Mo or Cu are disclosed added to the substrate. (col. 5 line 22-32)

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Acid resistance of a stainless steel substrate can be further improved by addition of one or more of Mo, Cu and N. When a fuel cell is operated in such the state that a current per a surface unit is elevated for increase of a power density, a separator is exposed to an acidic atmosphere with a lower pH value. Corrosion attacks under such severe conditions are suppressed by addition of one or more of approximately 0.2-7 wt. % Mo, approximately 0.1-5 wt. % Cu and approximately 0.02-0.5 wt. % N to a stainless steel. Acid resistance of the stainless steel is also improved by addition of a small amount of Ti, Nb and/or Zr as occasion demands.

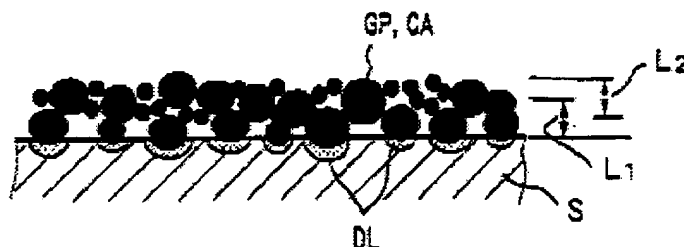
The diffusion layer is specifically disclosed to be resistant to peeling. (col. 6 line 8-15)

shown in FIG. 2B. The diffusion layer DL effectively improves adhesiveness of the graphite particle GP to the stainless steel substrate S. since the graphite particles GP have improved adhesiveness, they are not peeled off the surface of the stainless steel S. when the stainless steel S is subjected to pressing, corrugating or the like during which the surface of the stainless steel substrate S is scrubbed with dies. The diffusion layer DL is also effective for further

As to the resistance of the low electric resistance layer, this layer is reasonably presumed to have a resistance equal to or lower than  $1000 \mu\Omega\text{cm}^2$  in view of this material being carbonaceous and in view of Applicant's disclosure that a carbon material has a resistance value equal to or lower than  $\mu\Omega\text{cm}^2$ . (page 25 of Applicant's specification, 1<sup>st</sup> paragraph) Thus, the graphite particles would naturally flow to have the instant resistance value.

As can be appreciated in view of Figure 5, the low electric resistance layer [GP, CA] is provided as the topmost layer.

FIG. 5



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As to the peeling resistance layer and the corrosion resistance layer provided as one layer, as shown in Figure 5 the peeling resistance layer [DL] is substantially within the substrate body with the latter having a superficially oxidized layer functioning as a corrosion resistant layer, as discussed above. To this extent, the peeling resistance layer and the corrosion resistance layer are considered to be within one layer.

Claim 17 depends from independent claim 1 which is noted to further limit the peeling resistant layer to consist of nickel, however, since the scope of claim 1 in reciting "at least two layers" in Markush format does not require the peeling resistant layer, to this extent Fukui anticipates the scope the present claims.

Claim 16 is rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Fukui et al as applied to claims 1-5 and 17 above.

Of note, while the process by which the separator is prepared has not been given patentable weight (especially in view of the method claims having been withdrawn from consideration), Fukui teaches a coating process for forming the separator such as exemplified by the process of vapor deposition.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian A. Mercado whose telephone number is (703) 305-0511. The examiner can normally be reached on Monday through Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

jam

November 6, 2002